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EXAMINER	
CHORBAJI, MONZER R	
ART UNIT	**PAPER NUMBER**
1744	

DATE MAILED: 11/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/601,009	PIJLS, THOMAS FERDINAND A.	
	Examiner	Art Unit	
	MONZER R. CHORBAJI	1744	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 September 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *25-47* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *25-47* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *17 June 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

This non-final action is in response to the amendment received on 09/01/2005

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 25-37, 40 and 43-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnston (U.S.P.N. 2,401,077) in view of Arndt (U.S.P.N. 3,843,828) and further in view of Rubens (EP 0 438 783).

With respect to claim 25, the Johnston reference teaches sterilizing liquid products such as milk using steam (page 2, left column, lines 27-33) by atomizing the liquid product in the presence of steam (page 3, left column, lines 10-28). Steam is at a pressure of between 3.45 bar to 9.65 bar (page 3, left column, lines 22-23 and lines 34-36). The Johnston reference fails to teach the following: liquid product with at least 45 wt. % solid content, explicit residence time between 0.2 msec and 20 msec, and liquid

to steam weight ratio between 1.6 and 10.The Arndt reference, which is in art of heat treatment of liquid products, teaches that the product liquid solid content should be maintained between 3% to 50% by weight (col.4, lines 13-15). Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the process of the Johnston reference by maintaining the solid content between 3 and 50 percent by weight as taught by the Arndt reference since percent by weight values outside such a range leads to negative economic processing incentives (col.4, lines 13-24).

With respect to claim 25, the Arndt reference fails to teach residence time between 0.2 msec and 20 msec and liquid to steam weight ratio between 1.6 and 10. The Rubens reference, which is in the art of heat-treating liquid products, teaches that feed rate of starch as one of the variables (page 5, numbered lines 20-21) upon which the chamber temperature depends on. The chamber temperature can be varied and is a function of steam (page 5, numbered lines 16-20). This statement infers that the feed rate of steam and starch into the chamber can be varied to achieve various temperatures. On pages 7-8, examples 2-3, the Rubens reference shows that the starch mass flow is 7.26 kg/min and the steam mass flow is 9.1 kg/min for a ratio of 0.8. Also, on page 5, numbered lines 32-35 the Rubens reference teaches that various operational models with various desired flow rates of steam and starch are known and that size of the nozzle vent can be adapted to such different models. This statement implicitly means that the flow rates for starch and steam can vary depending on the operational model used. Thus, it would have been obvious to one having ordinary skill in

the art at the time the invention was made to modify method of the Johnston reference by maintaining the weight flow rates of liquid product to steam at certain values since the mixing chamber temperature depends on such weight flow ratios as taught by the Rubens reference (page 5, numbered lines 18-21) and optimizing such flow ratios is a matter of routine experimentation that depends on the liquid product sterilized.

With respect to the recited residence time, the Johnston reference recognizes that prolonged residence time leads to chemical changes in food products (page 1, left column, lines 35-42 and right column, lines 17-23) and that, for example, milk can be sterilized in less than one second using steam (page 3, right column, lines 20-22). In addition, the Johnston reference teaches that the residence time is a function of the length of the mixing chamber for the milk particles to travel through (page 3, left column, lines 41-47). The Rubens reference teaches that residence time depends on the size of the mixing chamber and that the size of the mixing chamber can be modified depending on the amount of heat applied to the liquid product (page 5, numbered lines 4-11). Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the process of the Johnston reference by minimizing the size of the mixing chamber and thus the residence time as taught by the Rubens reference since milk can be sterilized in less than one second in order to prevent undesirable chemical or physical changes due to steam sterilization as taught by the Johnston reference since such a residence time modification is a matter or routine experimentation.

With respect to claims 27, 29, 33-34 and 43, the Johnston reference teaches the following: a steam pressure of 9.65 bar (page 3, left column, lines 22-23), food product such as milk that contains for example, fats, the temperature of the mixing chamber is for example at 121 degree Celsius (page 3, left column, lines 24-25), milk, which is an emulsion is stable since it is sterilized with steam at residence time of less than one second and decimal reduction of at least 2 is achieved (page 3, right column, lines 24-29).

With respect to claim 28, the Johnston reference fails to teach a range value for solid content in liquid products and the Arndt reference teaches that solid contents above about 50% by weight makes further processing difficult (col.4, lines 18-20); however, what one inventor considers difficult is a subjective opinion that may not be true to different types of liquid products. The Rubens reference discloses various values for solid contents (examples 1-5) and teaches that the amount of solid content is a variable (page 58, numbered lines 20-21) that can be changed as shown in examples 1-5. As a result, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the intrinsic solid content of the Johnston reference to 53% by weight or higher since such a modification depends on the specific type of liquid product and is a matter of routine experimentation.

With respect to claims 26 and 30-31, both the Johnston reference and the Arndt reference fail to disclose specification values for the size of the mixing chamber and for the outlet opening. The Rubens reference discloses a size for the mixing chamber (page 5, numbered lines 4-7) and for the outlet opening between 6.3 mm to 13 mm

(page 5, numbered lines 32-35) and teaches that the value for the opening can be made smaller depending on other variables, i.e., temperature such that modifying the diameter of the outlet opening is a matter of choice of design that depends of the type of operational model used (page 5, numbered lines 33-35). Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify method of the Johnston reference by modifying the sizes of the mixing chamber and the outlet openings as taught by the Rubens reference since such modifications depend on the temperature and moisture content desired as well as the flow rates of the heating medium for heat treating liquid products (page 5, numbered lines 6-7 and lines 33-34).

With respect to claim 32, both the Johnston reference to disclose and the Arndt reference fail to disclose a weight ratio between the liquid product and steam; however, the Rubens reference teaches that feed rate of starch as one of the variables (page 5, numbered lines 20-21) upon which the chamber temperature depends on. The chamber temperature can be varied and is a function of steam (page 5, numbered lines 16-20). This statement infers that the feed rate of steam and starch into the chamber can be varied to achieve various temperatures. On pages 7-8, examples 2-3, the Rubens reference shows that the starch mass flow is 7.26 kg/min and the steam mass flow is 901 kg/min for a ratio of 0.58. Also, on page 5, numbered lines 32-35 the Rubens reference teaches that various operational models with various desired flow rates of steam and starch are known and that size of the nozzle vent can be adapted to such different models. This statement implicitly means that the flow rates for starch and

steam can vary depending on the operational model used. Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify method of the Johnston reference by maintaining the weight flow rates of liquid product to steam at certain values since the mixing chamber temperature depends on such weight flow ratios as taught by the Rubens reference (page 5, numbered lines 18-21) and optimizing such flow ratios is a matter of routine experimentation that depends on the liquid product sterilized.

With respect to claims 37 and 40, both the Johnston reference and the Arndt reference fail to teach drying the liquid product after sterilization and agglomerating the sterilized liquid product in dried powder form; however, the Rubens reference teaches that after heat treating the liquid product, the liquid product is spray-dried causing the atomized particles of the product to agglomerate (page 5, numbered lines 50-55). As a result, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify method of the Johnston reference by including a spray-drying step after sterilizing the liquid product as taught by the Rubens reference since spray-drying resulted in a good dispersibility, a stable, "heavy" body, and finely textured surface (page 6, numbered lines 50-52).

With respect to claims 35-36, the Johnston reference teaches rapidly cooling the sterilized product (page 3, left column, lines 65-68), but fails to teach a flash system. The Arndt reference teaches that after treating the product with steam, passing the heated product to a flash system (col.5, lines 55-67). Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the

process of the Johnston reference by including a flash system as taught by the Arndt reference since a flashing system causes substantial cooling of the treated product resulting in shorter product heat exposure (col.5, lines 65-67 and col.6, lines 1-4).

With respect to claims 44-45, the Johnston reference sterilizes milk products (page 1, left column, lines 1-7) such that milk is intrinsically a food for infants.

3. Claim 38 is rejected under 35 U.S.C. 103(a) as being unpatentable over Johnston (U.S.P.N. 2,401,077) in view of Arndt (U.S.P.N. 3,843,828) and Rubens (EP 0 438 783) as applied to claim 37 and further in view of Bond et al (U.S.P.N. 5,210,958).

With respect to claim 38, the Johnston reference, the Arndt reference and the Rubens reference all fail to teach recycling the used steam; however, the Bond reference, which is in the art of steam treatment, teaches re-circulating used steam by increasing its temperature and returning it to the drying chamber (figure 1, 10, 18, 20, 18a and 22). Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the process of the Johnston reference by including a steam re-circulating means as taught by the Bond et al reference in order to lower the overall energy consumption of the process (col.2, lines 44-49).

4. Claims 39 and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnston (U.S.P.N. 2,401,077) in view of Arndt (U.S.P.N. 3,843,828) and Rubens (EP 0 438 783) as applied to claim 37 and further in view of Scott et al (U.S.P.N. 3,925,560).

With respect to claim 39, the Johnson reference, the Arndt reference and the Rubens reference all fail to teach an average value range for the diameter of dried

particles; however, the Scott reference, which is in the art of heat treating liquid products, teaches that after spray-drying the liquid product, the particles have a diameter between 10-60 micrometer (col.5, lines 4-5). Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the process of the Johnston reference by including a spray-drying step after steam sterilization that produces particles with diameters between 10 to 60 micrometer as taught by the Scott reference in order to form voids in the particles resulting in added advantage (col.3, lines 32-35).

With respect to claim 46, the Johnston reference sterilizes milk products such that milk is intrinsically a food for infants; however, both the Johnston reference and the Arndt reference fail to teach drying the liquid product after sterilization. Both the Rubens reference and the Scott reference discloses the concept of drying treated food products, specifically, the Rubens reference teaches that after heat treating the liquid product, the liquid product is spray-dried causing the atomized particles of the product to agglomerate (page 5, numbered lines 50-55). As a result, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify method of the Johnston reference by including a spray-drying step after sterilizing the liquid product as taught by the Rubens reference since spray-drying resulted in a good dispersibility, a stable, "heavy" body, and finely textured surface (page 6, numbered lines 50-52).

5. Claim 41 is rejected under 35 U.S.C. 103(a) as being unpatentable over Johnston (U.S.P.N. 2,401,077) in view of Arndt (U.S.P.N. 3,843,828) and Rubens (EP 0 438 783) as applied to claim 40 and further in view of Bond et al (U.S.P.N. 5,210,958).

With respect to claim 41, both the Johnston reference and the Arndt reference fail to teach drying liquid products with steam. The Rubens reference teach spray-drying liquid product after heat treatment by using hot air nozzles (page 5, numbered lines 49-54 and page 6, numbered lines 42-46), but fails to teach drying with steam. The Bond reference, which is in the art of steam treatment, teaches steam drying (col.3, lines 15-22). Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the process of the Johnson reference by including a steam drying means as taught by the Bond reference since steam drying can lead to a considerable capital cost savings and can also lead to a faster dry processing of products (col.2, lines 40-43).

6. Claim 42 is rejected under 35 U.S.C. 103(a) as being unpatentable over Johnston (U.S.P.N. 2,401,077) in view of Arndt (U.S.P.N. 3,843,828), Rubens (EP 0 438 783) and Bond et al (U.S.P.N. 5,210,958) as applied to claim 41 and further in view of Hovmand et al (U.S.P.N. 4,062,641).

With respect to claim 42, the Johnston reference, the Arndt reference, the Rubens reference and the Bond reference all fail to teach re-circulating non-agglomerated particles to the drying chamber through spray nozzles. The Hovmand reference, which is in the art of agglomeration, teaches applying sequential heating steps by re-circulating the non-agglomerated particles (col.1, lines 47-53). Thus, it

would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the process of the Johnson reference by including re-circulating means for non-agglomerated particles as taught by the Hovmand reference since a certain degree of agglomeration is desired for good dispersibility of food products in water and milk (col.6, lines 36-38).

7. Claim 47 is rejected under 35 U.S.C. 103(a) as being unpatentable over Johnston (U.S.P.N. 2,401,077) in view of Arndt (U.S.P.N. 3,843,828), Rubens (EP 0 438 783) as applied to claim 25 and further in view of Bosund et al (U.S.P.N. 4,091,003).

With respect to claim 47, the Johnston reference, the Arndt reference and the Rubens reference fail to explicitly disclose intrinsic features relating to the amount of solid product used in relation to the amount of steam; however, the Bosund reference, which is in the art of producing dried protein concentrate, teaches that the protein solution to be dried is contacted in a packed column with steam where 0.1 to 1.0 kg of steam is used per kg of protein solution (col.4, lines 43-48). Instant claim 47 recites the equivalence inverse of the Bosund reference such that upon inversion, for example, the solid content is 5 kg protein/kg steam (1kg protein/0.2 steam = 5 kg protein/kg steam). Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the intrinsic features of the Johnston method modifying the product to steam mass ratio values as taught by the Bosund reference since operating within this mass ratio range, deodorization and removal of all undesirable volatiles is achieved (col.4, lines 35-38).

Remarks

8. Due to typographical errors in inputting the numerical values for mass flow rates for starch and steam as shown on page 3, line 17 of the action dated 06/01/2005, the action is made non-final.

Response to Arguments

9. Applicant's arguments filed on 09/01/2005 have been fully considered but they are not persuasive.

On page 7 of the Remarks section, applicant argues that, "However, nowhere does Johnston teach or suggest that sterilization may be achieved in the claimed time period of between 0.0002 seconds and 0.02 seconds, a time period that is many times shorter than the one or two second time period taught by Johnston." The examiner disagrees since the Johnston reference teaches (col.3, lines 20-23) that sterilization is accomplished inside one a second time. This statement means that sterilization is accomplished in less than one second. Furthermore, the specification teaches on page 9, numbered lines 27-30 that residence time is a function of the temperature, the product and the required reduction of the number of germs. This statement implies that based on, for example, the degree of microorganism reduction, residence time can vary and is not limited to a certain range but is subject to modification. In addition, the Johnston reference teaches that the residence time is a function of the length of the mixing chamber for the milk particles to travel through (page 3, left column, lines 41-47). The Rubens reference teaches that residence time depends on the size of the mixing chamber and that the size of the mixing chamber can be modified depending on the

amount of heat applied to the liquid product (page 5, numbered lines 4-11). Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the process of the Johnston reference by minimizing the size of the mixing chamber and thus the residence time as taught by the Rubens reference since milk can be sterilized in less than one second in order to prevent undesirable chemical or physical changes due to steam sterilization as taught by the Johnston reference since such a residence time modification is a matter or routine experimentation.

On page 8 the Remarks section, applicant argues that, "With respect to pasteurization, Applicant respectfully submits that milk is typically pasteurized for at least two seconds (Attachment A, Wikipedia definition of pasteurization, first paragraph under milk pasteurization heading)." The Attachment A teaches various food sterilization methods, for example, the UHT method involves holding milk at a certain temperature for at least 2 seconds; however, on page 3 of the Attachment, a newer method with even undisclosed shorter exposure times in order to preserve taste and color of food. This Attachment leads one of ordinary skill in the art to shorten exposure time to a less than one second at higher temperature for the benefit of better preserving color and taste of products.

On page 8 of the Remarks section, applicant argues that, "Furthermore, Applicant respectfully submits that the Arndt reference is non-analogous art and, therefore, is not properly combinable with the Johnston reference." The examiner disagrees. The Arndt reference like the instant claims, mixes food product with steam

that result in pasteurizing the product. See col.4, lines 25-40 or col.6, lines 53-63 or col.10, lines 28-31.

On page 10 of the Remarks section, applicant argues that, "Based on the teachings of the Rubens reference, one of skill in the art would not be motivated to increase the ratio to a value within Applicant's claimed range due to the potential for nozzle blockage when spraying gelatinized starch having a high starch slurry ratio." The examiner disagrees since on page 5, numbered lines 29-35, the Rubens reference teaches that the size of the vents can be modified depending on the temperature and moisture content desired as well as the flow rates of both mediums such that based on the applicant's argument, vents with larger sizes will not have any blockage problems.

On page 11 of the Remarks section, applicant argues that, "Furthermore, Applicant respectfully submits that the Rubens reference is non-analogous art that is not properly combinable with the Johnston reference." The examiner disagrees since the Rubens reference is in art of heat treatment of liquid products. See examples 1-5.

On page 12 of the Remarks section, applicant argues that, "Bond is not concerned with pasteurization or sterilization and as such is non-analogous art not properly combinable with the Johnston reference." The examiner disagrees since the Bond reference is in the art of steam treatment. The Bond reference is only combined to show the concept of recycling used steam is known and not for other features that have already been disclosed in the Johnston, the Arndt and the Rubens references.

On page 13 of the Remarks section, applicant argues that, "Scott et al. is not concerned with pasteurization or sterilization and as such is non-analogous art not

properly combinable with the Johnston reference." The examiner disagrees since just like the instant claims, the Scott reference is in the art of heat-treating liquid products, teaches spray-drying the liquid product that results in forming particles having a diameter between 10-60 micrometer. The Scott reference is only combined to show that the concept spray drying the liquid product that results in forming particles having a diameter between 10-60 micrometer is known and not for other features that have already been disclosed in the Johnston, the Arndt and the Rubens references.

On page 14 of the Remarks section, applicant argues that, "Hovmand et al. is not concerned with pasteurization or sterilization and as such is non-analogous art not properly combinable with the Johnston reference." The examiner disagrees since the Hovmand reference is in the art of agglomeration, which is an essential part of the instant claims. The Hovmand reference is combined to show applying sequential heating steps by re-circulating the non-agglomerated particles is known and not for other features that have already been disclosed in the Johnston, the Arndt and the Rubens references.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The Hsu (U.S.P.N. 4,724,620) reference discloses mass ratio of product to steam and the Pisecky et al (U.S.P.N. 4,141,783) reference discloses a weight ratio between milk and steam as recited in instant claim 1.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MONZER R. CHORBAJI whose telephone number is (571) 272-1271. The examiner can normally be reached on M-F 6:30-3:00.

12. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, JOHN KIM can be reached on (571) 272-1142. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

13. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Monzer R. Chorbaji MRC
Patent Examiner
AU 1744
11/03/2005

JOHN KIM
SUPERVISORY PATENT EXAMINER